Chapter 7

Tier 0: Desktop Screening

The breakdown of screening and sampling in the following chapters that focus on the Tiered Approach are just one way of designing a state-wide monitoring program. Agency analysis of resources and program objectives should direct the custom development of any monitoring program.

The desktop screening assessment (or Tier 0) consists of compiling documented information for the estuary or coastal marine areas of concern through a literature search and sending survey questionnaires to local experts. No field observations are made at this assessment level. Desktop screening should precede any of the three subsequent tiers. Its fundamental purpose is to support the planning for monitoring and more detailed assessments. It incorporates time and cost efficiencies, allowing evaluation of a large number of sites, and identifying potentially affected areas for further investigation in higher tiers. Table 7-1 gives an overview of the components, sources, and uses of a desktop screening assessment.

7.1 Area and Geomorphometric Classification

The size and classification of the estuary indicates the potential for the environment to respond to various types of impacts. In addition, the classification refers to the type of circulation (e.g., gravitational, tidal, wind-induced) that dominates the estuary. Well-recognized estuary types include:

▸ Coastal plain estuary;
▸ Lagoon;

Table 7-1. Tier 0 Desktop screening for estuaries and coastal marine waters.

Component	Information Source	Use
Estuary area	USGS quad maps, GIS	-support planning for monitoring and more detailed assessments -incorporates time & cost efficiencies -allows evaluation of a large number of sites
Geomorphic classification	USGS quad maps, GIS	
Habitat type	NOAA bathymetry charts; historic surveys by federal, state agencies, and universities	
Biological assemblages	Historic data from federal, state agencies, and universities. NMFS for marine mammal data	
Watershed land use	USGS land use maps; state and county planning agencies; local zoning agencies; USDA CSREES	
Population density	US census data	
NPDES discharges	State water quality agency and regional USEPA offices, PCS database	
Water column & bottom characteristics	Historic data from federal, state agencies, and universities; STORET, NODC databases	

▸ Fjord;
▸ Tectonically-caused estuary.

7.2   Habitat Type

Partitioning of the resource by habitat type (open water, soft bottom substrates, hard bottom substrates, aquatic macrophytes, high/low energy beaches, sandflat, mudflat, emergent marsh) will usually be required and the extent of the partitioning will depend on the size of the system and environmental gradients. Initial subdivisions should be based on salinity gradients, water depth, and sediment type, particularly in coastal marine areas.

7.3   Watershed Land Use

The pollutant and sediment load of fresh water inflow into the estuary will inevitably have some form of impact on habitat and biota and this land use information may subsequently help identify causes of impairment. Nonpoint source pollution has been shown to be a major contributor to the degradation of our aquatic resources. Land use information will help determine the type of contaminants that are being flushed into the estuary. For example, storm water runoff from urbanized and industrial areas may contain various types of toxins. Runoff from agricultural areas could be expected to contain fertilizers, pesticides, and sediment. Fertilizers have the potential to accelerate eutrophication by excessive nutrient enrichment, while pesticides may have at least short-term toxic effects.

7.4   Population Density

This indicates the potential for the whole array of impacts to the estuary and coastal marine waters from concentrated human activity. The more populated the area surrounding the

estuary or coastal region, the higher the potential for human-induced impacts.

7.5   NPDES Discharges

Industrial and municipal point source dischargers must file monthly discharge monitoring reports (DMRs) that provide the effluent concentrations for the contaminants in the effluent which they are required to monitor. This data is accessible via USEPA's PCS. Knowing the number, type and location of point source dischargers could provide the background information necessary for characterizing the contaminants entering the estuary and the regions within the estuary or coastline that would be most affected by the discharge.

7.6   Biological Assemblages

Existing information on any of the target biological assemblages (benthos, fish, macrophytes, photoplankton, zooplankton, epibenthos, paleoenvironmental systems) can be valuable for:

▸ Identifying potential reference sites, and potentially impaired areas;

▸ Determining presence/absence of major taxonomic groups and indicator organisms;

▸ Evaluating spatial and temporal variability of the biological assemblages.

This information can be used to help determine target assemblages for higher-level tiers and the sampling design and methods that might be appropriate.

7.7 Water Column and Bottom Characteristics

Existing data on water column and bottom characteristics will be crucial to support the identification of appropriate sampling strata based on salinity, grain size, or depth. Further, this information can help states identify potentially impaired areas; i.e., areas receiving high nutrient loadings or containing contaminated sediments.